L 05290-67
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0

The confused antecedent S_α is a non-S_1 noun to which the personal pronoun replacing S_2 may be erroneously referred. The noun S_2 may be replaced with a 3rd person pronoun in the following cases: 1) If between S_1 and S_2 there do not exist any one of the following relations: a) S_1 and S_2 are in the same clause and are syntactically connected; b) S_1 is to the left of the first word of the first principal clause which entirely precedes the clause with S_2; c) one of the initial nouns enters into homonymous locution from which the other noun is excluded. 2) If either S_α is absent or, given the presence of S_α, between each S_α and S_2 there exists at least one of the relations not permissible for S_1 and S_2 (cf. a, b, c), taking S_α as S_1 or, lastly, in the presence of S_α the following relationship exists between S_1, S_2 and each "dangerous" S_α: S_α and S_2 are present in different clauses while S_1 and S_2 are both in the same clause and are not separated by S_α. The presented result of the verification of these rules with respect to 400 pairs of S_1 and S_2 show that the rules, while not always valid, produce correct results in 89% of cases. Ways of further refining the rules are pointed out. O. Kulagina. [Translation of abstract]

SUB CODE: 05, 09

Card 2/2 egh

22977

18.3100 1087, 1454, 1208 S/180/61/000/003/005/012
E193/E183

AUTHORS: Darvoyd, T.I., Vigdorovich, V.N., and Iordanskaya, N.A.

TITLE: Purification of thallium by the crystallization methods

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1961, No.3, pp. 55-62

TEXT: Growing demand for high purity thallium in the semiconductor, atomic energy, and optical industries prompted the present author to undertake a systematic study of refining of this metal by the zone melting and crystal pulling techniques. The possibilities of these techniques were first evaluated on the basis of the analysis of the Tl-rich ends of the constitution diagrams of the relevant binary alloy systems. The results of this analysis are presented in Fig.2. Metals with a relatively high solid solubility in Tl are grouped in the left-hand side of the diagram showing their position in the periodic table of the elements; those whose solid solubility in Tl is extremely low are grouped on the right-hand side. Where possible, the distribution coefficients K were determined from the appropriate constitution diagrams and these are quoted under the symbol of the given metal; the numbered

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arrows indicate groups of metals which (1) form with Tl systems of relatively simple type, (2) are insoluble in liquid Tl, and (3) are characterized by $K > 1$. It was inferred from the results of this analysis that most of the impurities likely to be present in thallium (with the exception of metals that are close neighbours of thallium in the periodic table) should be capable of being removed by the crystallization methods, the object of the experimental work carried out by the present author being to check this prediction. The experiments were conducted on Tl specimens with known impurity content, some of which had been preliminarily refined by the alkaline or electrolytic methods. The crystal pulling experiments were conducted in vacuum (10^{-4} mm Hg); both the crucible and the crystal were rotated (in opposite directions) at 25 and 50 revs/min respectively, the rate of crystal pulling varying between 0.4 and 2 mm/min. The zone refining tests were carried out in O-free, dry nitrogen on bars 150-180 mm long and weighing 20-30 or 150 g. The width of the molten zone was approximately 15 mm, the rates of zone traverse employed being

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0.5, 1.0 and 2.0 mm/min. Electromagnetic stirring was used in some experiments and the distribution of impurities in the refined bars was determined after 5, 10 and 20 passes; depending on the type of impurity, chemical, spectrographic and radioactive tracer techniques of analysis were used. In the analysis of the results obtained, the behaviour of Cu, Ag, Zn, Sn, Fe, Ni, Mn, S, and Pb is discussed. Some of the typical results are reproduced graphically. Thus, in Fig.4 the Cu concentration ($C \times 10^4$ wt.%) in the zone refined bar of Tl is plotted against the distance (in % of the bar length, l) from the starting end. The four curves relate to bars, examined after 10 (curves 1 and 3) and 20 (curves 2 and 4) passes and refined at the zone traverse rates of 1.0 (curves 1 and 2) or 0.5 (curves 3 and 4) mm/min, the initial Cu content being shown by the broken line - - - -. Fig.6 shows the distribution of sulphur in a bar obtained by the crystal pulling technique (pulling rate 0.5 mm/min); here, the S concentration ($C \times 10^3$ wt.%) is plotted against the distance from the starting end, measured as the ratio, g, of the weight of the analysed to the

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total length of the bar. Curves 1, 2 and 3 relate to bars obtained after the molten metal had been held at the temperature for 6, 7 and 11 hours respectively. Finally, the effect of electromagnetic stirring is illustrated in Fig.8, showing the distribution of Cu in a zone-refined bar. Here, log C is plotted against the distance (% 1) from the starting end of the bar, obtained with (curves 1 and 2) or without (curves 3 and 4) the application of stirring, at the zone traverse rates of 0.5 (curves 1 and 3) and 1.0 (curves 2 and 4) mm/min. The initial Cu concentration is shown by the broken line. It was concluded that in many cases the zone refining and/or crystal pulling experiments yielded results better than those predicted from the theoretical considerations. This improvement in the segregation coefficient was attributed to the effect of secondary factors. Thus, for instance, the removal of Cd, Hg, and S was assisted by volatilization, that of Cu and Sn by oxydation. Iron which is insoluble in Tl cannot be separated by the methods studied, and filtration has to be used in this case. This is quite an effective method, as has been shown by the results of

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experiments in which the thallium samples, containing 1.8×10^{-4} and $> 10^{-3}$ % Fe, were filtered through porous graphite, after which the Fe concentration was reduced to less than 5×10^{-5} and 10^{-4} %. The concentration of lead in thallium cannot be reduced by the zone refining techniques, and this metal has to be removed by other (alkaline, electrolytic) methods. The effectiveness of zone refining of thallium is greatly increased by the application of electromagnetic stirring.

A.A. Il'inskaya, I.M. Blokh, N.P. Men'shova, V.G. Goryushina, M.A. Notkina, Ye.Ya. Biryukova, V.A. Nazarenko, B.S. Tsivina, N.K. Davidovich and L.I. Gosteva are mentioned for their contributions.

There are 8 figures and 13 references: 10 Soviet and 3 non-Soviet. The English language references read as follows:

Ref.6: K.D. Alexopoulos. Acta crystallogr., 1955, V.8, part 4, p.235

Ref.8: M. Hansen, Kr Anderko. Constitution of binary alloys. McGraw-Hill Publishing Company, N.Y. - Toronto - London, 1958.

Card 5/ 9

22977
S/180/61/000/003/005/012
E193/E183

Purification of thallium by the ....

Ref.9: J.L. Haughton, A. Prince. The constitutional diagrams of alloys: a bibliography. The Institute of Metals, London, 1956.

ASSOCIATION: Giredmet/In-t tsvetnykh metallov im. Kalinina (Giredmet/Institute of Non-ferrous Metals imeni Kalinin)

SUBMITTED: October 8, 1960

Card 6/9

S/080/62/035/010/004/012
D204/D307

AUTHORS: Vigdorovich, V.N., Darvoyd, T.I., Iordanskaya, N.A. and Mamayev, Yu.O.

TITLE: A study of the distribution of Ag admixtures in the crystallization methods of the purification of thallium

PERIODICAL: Zhurnal prikladnoy khimii, v. 35, no. 10, 1962, 2165-2170

TEXT: The above subject was investigated in continuation of earlier work concerned with the study of phenomena associated with the purification of Tl from various metallic admixtures by crystallization methods, to determine the effectiveness of purification in relation to the initial concentration of the impurity and to the rate of purification, the amounts of Ag being varied between 0.25 and 5 x 10^{-6}%. The Tl crystals were extracted from the melt, contained in a graphite crucible, under a pressure of 10^{-4} mm Hg, and were 100 - 200 mm long and 8 - 10 mm in diameter. The rates of

Card 1/2

A study of the distribution ...

extraction, f, were made 0.5, 1.0, and 2.0 mm/min, the crucible being revolved at 25 rpm and the extracting wire at 50 rpm in the opposite direction. The metallic rods were zone-crystallized, under O_2-free, dry N_2, and the distributions of Ag along the rods were determined after 5 passes, chemically (for $< 10^{-3}$% Ag) and by an isotope method (for $\geqslant 10^{-3}$% Ag). L.A. Radushkevich and I.V. Vlasovaya assisted in these determinations. Effective distribution coefficients, k, (defined by $k = C/C_o (1 - g)^{k-1}$, where C_o is the initial concentration of Ag and C is that at a distance g from the point at which crystallization front was started) calculated from data obtained by these 2 methods, were in fair agreement. The results are discussed, showing that k decreased with decreasing C_o, and was lower for higher values of f. The effect of f on k also became greater with decreasing C_o. In practice, complete purification of Tl from Ag admixtures, by extracting a crystal from the melt and zone-purification, is only effective when C_o is low, ($\leqslant 10^{-4}$% Ag); the efficiency of the process may be increased by lowering the rate of crystallization, e.g. to 0.5 mm/min. There are 4 figures and 1 table.

Card 2/2

SUBMITTED: April 24, 1961

IORDANSKAYA, N.I.

Changes in the extra- and intramural nervous system in cardiospasm.
Kaz. med. zhur. no. 2:49-51 Mr-Ap '61. (MIRA 14:4)

1. Klinika obshchey khirurgii (zav. - prof. A.A. Polyantsev) Stalingradskogo meditsinskogo instituta i khirurgicheskoye otdeleniye oblastnoy bol'nitsy (glavnyy vrach - A.I. Gusev).
(CARDIOSPASM) (NERVOUS SYSTEM)

IORDANSKAYA, N. I.

Functional disorder of the vagus nerves in cardiospasm. Vest. khir. no.2:24-28 '62. (MIRA 15:2)

1. Is kliniki obshchey khirurgii (zav. - prof. A. A. Polyantsev) Volgogradskogo meditsinskogo instituta i oblastnoy klinicheskoy bol'nitsy. Adres avtora: Volgograd, Angarskaya ul., oblastnaya bol'nitsa. klinika obshchey khirurgii.

(CARDIOSPASM) (VAGUS NERVE--DISEASES)

IORDANSKIY, N.N.

Some functional characteristics of a crocodile skull. Nauch. dokl. vys. shkoly; biol. nauki no.3:42-46 '63. (MIRA 16:9)

1. Rekomendovana kafedroy zoologii pozvonochnykh Moskovskogo gosudarstvennogo universiteta im. M.V.Lomonosova.
(Crocodiles) (Skull)

IORDANSKAYA, N.N.; SEREBRYAKOV, I.G.

Morphogenesis of a vital form of brushwood exemplified by the warty spindle tree Evonymus verrucosa Scop. Bot.zhur. 39 no.5: 768-773 S-O '54. (MLRA 7:11)

1. Zvenigorodskaya biostantsiya Moskovskogo gosudarstvennogo universiteta.
(Spindle tree)

IORDANSKAYA, N.N.

Phreatophytes of the Chernyye Zemli and some aspects of their ecology. Biul.MOIP.Otd.geol.31 no.3:117-118 My-Je '56.
(Chernyye Zemli--Botany) (MLRA 9:12)

IORDANSKAYA, N.N.

Some data on phreatophyte root systems in the Chernyye Zemli [with summary in English]. Biul. MOIP. otd. biol. 63 no.1:79-87 Ja-F '58. (MIRA 11:5)

(CHERNYYE ZEMLI--WATER, UNDERGROUND)

USSR/Pharmacology. Toxicology. Chemotherapeutic Preparations. C
A) Antibiotics

Abs Jour : Ref Zhur - Biol., No II, 1958, No 52086

Author : Iordanskaya, N. Ye., Matynkina A.A., Khachaturova T.I.
Inst : Uzbek Tuberculosis Institute
Title : The Immediate Therapeutic Effect of the Preparation Larusan

Orig Pub : Sb. tr. Uzb. n-i. tuberk. in-t, 1957, 3, 70-75

Abstract : Larusan (I) was administered to 54 patients (adults) with various forms of pulmonary tuberculosis (the majority with fibro-cavernous processes) in doses of 0.2 g, 3 times daily. It was demonstrated that I lowered toxemia, and in many cases led to improvement of the local process. Toxic side-effects (giddiness, headaches, excitement, precordial pains) were observed in 4 patients treated with I. As compared with phthivazid, I was less effective. -- V.I. Yel'nik.

Card : 1/1

IORDANSKAYA, N.Ye.; MATYNKINA, O.A.; KHACHATUROVA, T.I.

Immediate therapeutic affect from the drug, larusan. Sbor. trud. Uz. nauch.-issl. tub. inst. 3:82-86 '57. (MIRA 14:5)
(ISONICOTINIC ACID) (TUBERCULOSIS)

IORDANSKAYA, N.Ye.

Immediate results of antibacterial therapy combined with novocaine block in pulmonary tuberculosis patients. Sbor. trud. Uz. nauch.-issl. tub. inst. 3:105-110 '57. (MIRA 14:5)
(TUBERCULOSIS) (NOVOCAINE)

IORDANSKAYA, N.Ye., Cand Med Sci — (diss) "Novocain block[illegible] in symptomatic therapy of pulmonary tuberculosis." Tashkent, 1959, 16 pp (Min of Health UzSSR. Tashkent State Med Inst) 250 copies (KL, 33-59, 121)

NESMEYANOVA, P.N.; IORDANSKAYA, Ye.I.; BRAZOVSKAYA, F.A.

Effect of various doses of pyrogenal on the formation of a brain scar. Biul. eksp. biol. i med. 56 no.9:115-119 S '63. (MIRA 17:10)

1. Iz Instituta vysshey nervnoy deyatel'nosti i neyrofiziologii AN SSSR. Predstavlena deystvitel'nym chlenom AMN SSSR A.V. Lebedinskim.

USSR/Medicine - Physiology FD-2697

Card 1/1 Pub. 33-6/28

Author : Shatenshteyn, D. I.; Iordanskaya, Ye. N.

Title : Towards the physiology of the motor analysor of man

Periodical : Fiziol. zhur. 41, 35-42, Jan-Feb 1955

Abstract : Investigated the functional state of the central terminal of the motor analysor in man and the development of states of excitation and inhibition in it during work. Ergograms. Nine references, all USSR (6 since 1940)

Institution : Laboratory of Physiology of Labor of the Institute of Hygiene of Labor and Occupational Diseases of the Academy of Medical Sciences USSR

Submitted : December 24, 1953

IORDANSKAYA, Ye.N.

Size of a conditioned motor reflex in man as a function of intensity of conditioned auditory stimuli [with summary in English]. Zhur. vys.nerv.deiat. 8 no.1:28-35 Ja-F '58. (MIRA 11:3)

1. Institut biofiziki AN SSSR, Moskva.
(REFLEX CONDITIONED,
eff. of intensity of sound stimuli on level of motor reflex (Rus)

BRAZOVSKAYA, F.A.; NESMEYANOVA, T.N.; IORDANSKAYA, Ye.N.

Scar formation in the central nervous system under the influence of pyrogenal. Biul. eksp. biol. i med. 50 no. 11:121-123 N '60. (MIRA 13:12)

1. Iz fiziologicheskoy laboratorii Akademii nauk SSSR, Moskva.
(PYROGENS) (SPINAL CORD) (CICATRICES)

NESMEYANOVA, T.N.; BRAZOVSKAYA, F.A.; IORDANSKAYA, Ye.N.

Case of partial regeneration of nerve conductors in sectioned spinal cord in dogs. Fiziol.zhur. 46 no.2:202-209 F '60. (MIRA 14:5)

1. From the Physiological Laboratory, U.S.S.R. Academy of Sciences, Moscow.

(NERVOUS SYSTEM--DEGENERATION AND REGENERATION)

BRAZOVSKAYA, F. A.; NESMEYANOVA, T. N.; IORDANSKAYA, Ye. N. (Moskva)

Effect of pyrogenal on the formation of the cicatrix after sectioning of the spinal cord. Vop. neirokhirurgii no.3:6-9 '62. (MIRA 15:7)

1. Fiziologicheskaya laboratoriya Akademii nauk SSSR.

(SPINAL CORD--SURGERY) (CICATRICES)
(PYROGENAL)

IORDANSKIY, A., red. toma; ATROSHCHENKO, L., tekhn. red.

[Science and mankind, 1963] Nauka i chelovechestvo, 1963. Moskva, Izd-vo "Znanie," 1963. 522 p. (MIRA 17:1)

IORDANSKIY, A.B.

Radioautographic study of chromosome reproduction in Vicia faba. Dokl. AN SSSR 158 no.1:192-195 S-O '64 (MIRA 17:8)

1. Institut radiatsionnoy i fiziko-khimicheskoy biologii AN SSSR. Predstavleno akademikom A.N. Belozerskim.

IORDANSKIY, A.B.

Interchromatid exchanges in the chromosomes of beans. Tsitologiia 6 no.6:738-741 N-D '64. (MIRA 18:8)

1. Laboratoriya obshchey i kosmicheskoy kariologii Instituta radiatsionnoy i fiziko-khimicheskoy biologii AN SSSR, Moskva.

BOGDANOV, Yu.F.; IORDANSKIY, A.B.; GINDILIS, V.M.

Problem of multistrand chromosome model. Genetika no.5:82-100 N '65. (MIRA 19:1)

1. Institut molekulyarnoy biologii AN SSSR, Moskva. Submitted August 25, 1965.

IORDANSKIY, A.B.

Autoradiographic analysis of sister interchromatid exchanges in the third division following exposure to H^3-thymidine. TSitologiia 7 no.5:673-675 S-O '65. (MIRA 18:12)

1. Laboratoriya obshchey i kosmicheskoy kariologii Instituta radiatsionnoy i fiziko-khimicheskoy biologii AN SSSR, Moskva. Submitted March 19, 1965.

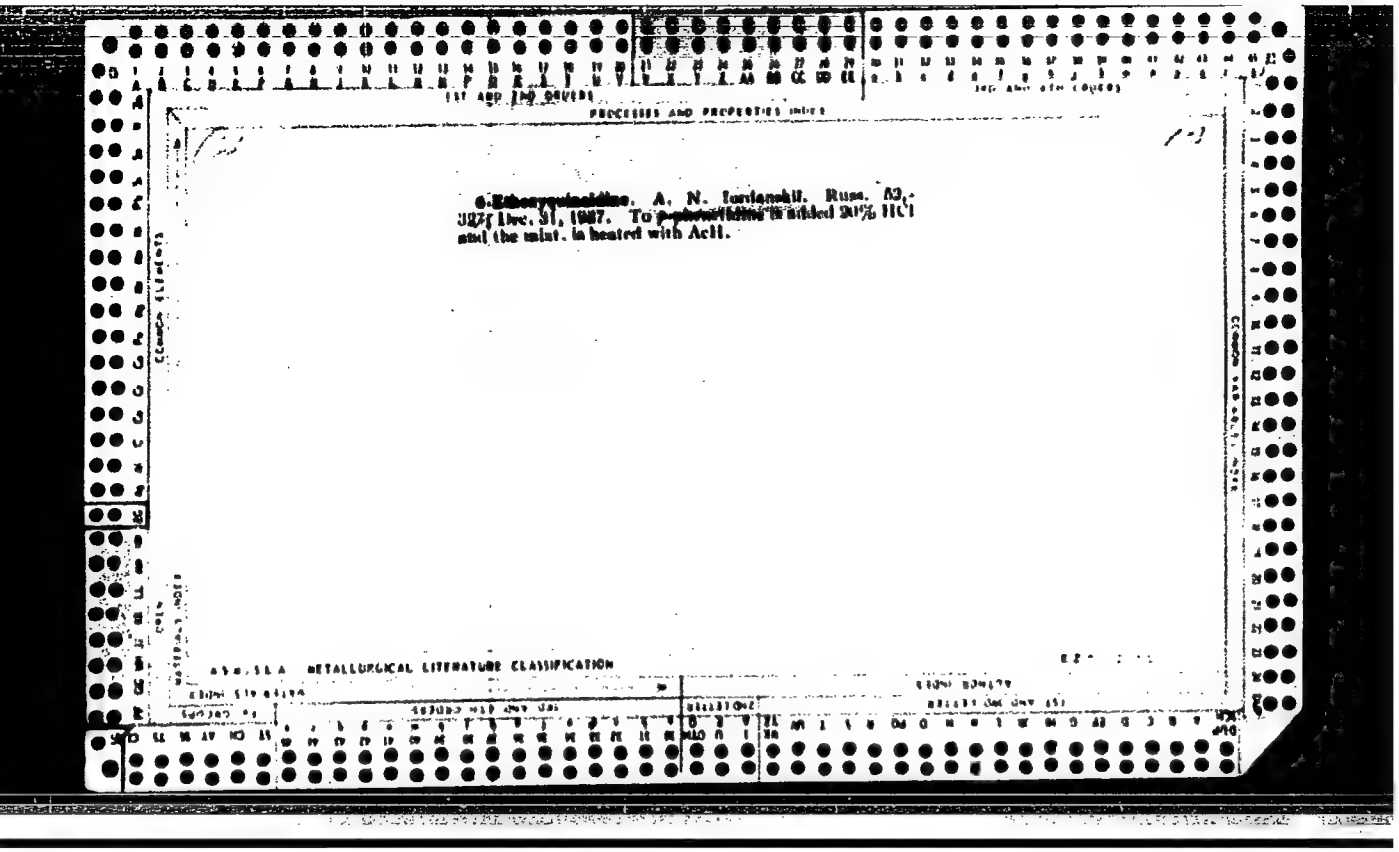
LUKASHEV, Konstantin Ignat'yevich; IORDANSKIY, A.D., red.

[Atoms and our planet] Atomy i nasha planeta. Moskva, Znanie, 1965. 91 p. (Narodnyi universitet: Estestvennonauchnyi fakul'tet, no.6) (MIRA 18:7)

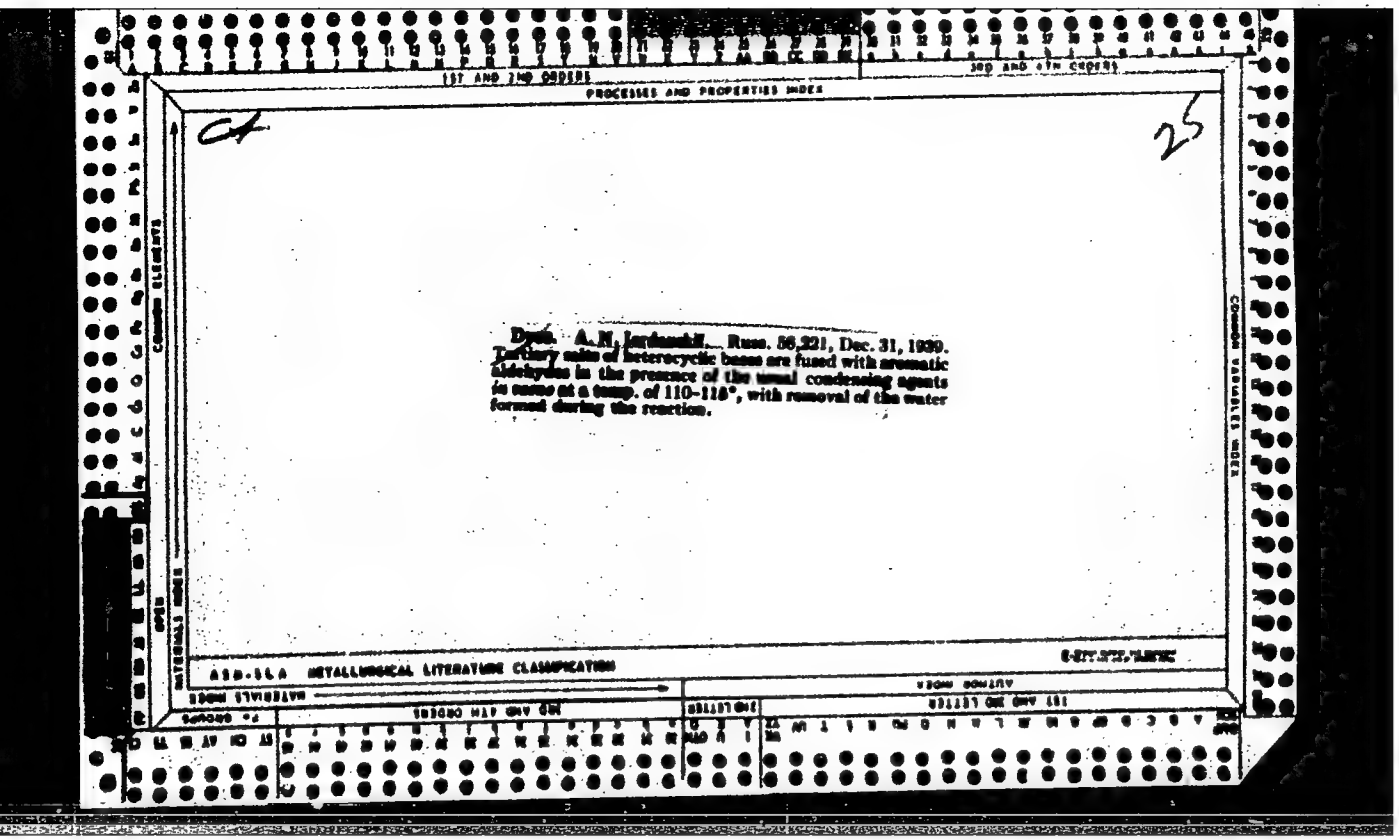
1. Vitse-prezident AN Belorusskoy SSR (for Lukashev).

IORDANSKIY, A.D., red. vypuska; ATROSHCHENKO, L., tekhn. red.

[Science and mankind] Nauka i chelovechestvo, 1962. Moskva, Izd-vo "Znanie," 1962. 404 p. (MIRA 16:6)
(Science--Yearbooks)



6-Ethoxyquinaldine. A. N. Iurlenskii. Russ. 83,
3827 Dec. 31, 1937. To p-phenetidine is added 20% HCl
and the mixt. is heated with AcH.



IORDANSKIY, A. et al.

"Colorphotography on Triple-Emulsion Light-sensitive Maters". Goskinoizdat, State Publishing House of Cinematographic Literature, M., 1949.

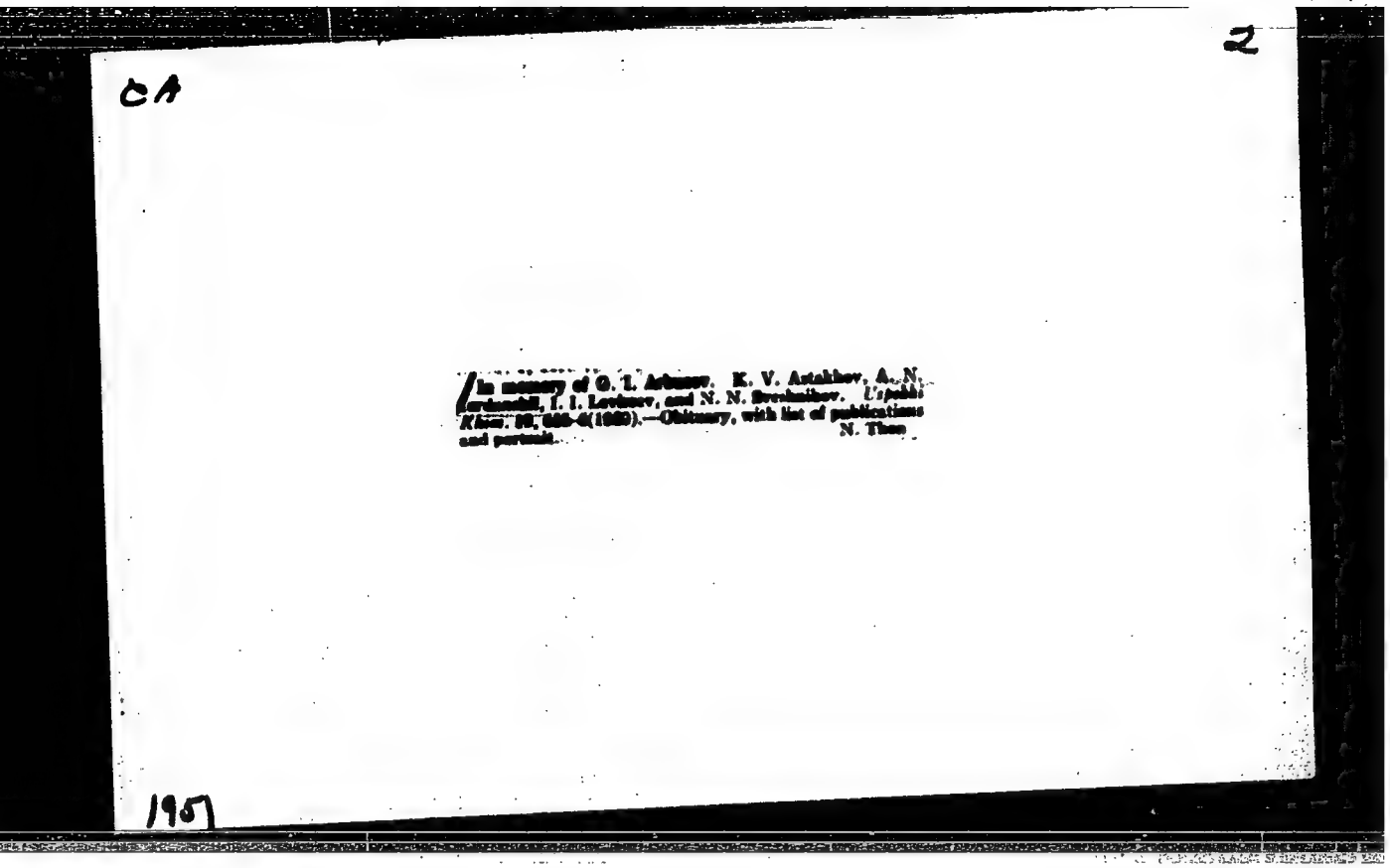
IORDANSKIY, A. N. et al

Color Photography on Three-Layer Photosensitive Materials. Goskinoizdat (1949)

IORDANSKIY, A. N. and CHELTZOV, V. S.

"Color in the Cinema", (tzvet v kino), published by the State Publishing House for Cinematography, Moscow, 1950.

SO: D-52286, 9 July 1954.



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In memory of O. I. Artamov, K. V. Astakhov, A. N. [illegible], I. I. Lovtsov, and N. N. Sveshnikov. *Uspekhi Khim.* 26, 635-6(1957).—Obituary, with list of publications and portrait.
N. Thon

1957

IORDANSKIY, A. N.

177T32

USSR/Chemistry - Photography Mar 51

"Brief Communication: The Yield of Dyestuffs in Color Development," A. N. Iordanskiy, G. I. Arbuzov, All-Union Sci Res Cine Photo Inst

"Zhur Prik Khim" Vol XXIV, No 3, pp 337-340

Showed by expt that in color development 1 mol of dyestuff that composes purple partial image is formed for each 4 atoms of reduced (metallic) AG, supporting theoretical ideas on dyestuff formation in process based in part on work by A. Ye. Paray-Koshits and G. I. Arbuzov. Showed for emulsions applied in practice true yield of dyestuff is independent of av grain size.

177T32

CA

5

The yield of dyes in color development. A. N. Jordanskii and G. I. Arbusov. *J. Applied Chem. U.S.S.R.* 24, 373-7 (1951)(Engl. translation); (Russ. ed., 337-40) cf. *C.A.* 45, 10163*i*.—The mol. ratio of azomethine dye (I) formed to Ag produced, on development of 3-layer color film, is predicted as 1:4 (Tull, *C.A.* 33, 9163[4]), and is described as a relative ratio by the Clieltsov ratio (II), $\Delta D_A/\Delta D_{Ag}$, where D_A and D_{Ag} are corresponding optical ds. of I (at $\lambda_{max.}$) and of Ag image. The D_A ($c_{max.}$)—concn. relation was detd. for a purple I (III), formed in substance and enamel, in 5% gelatin films at λ = 530 mμ, and was found to obey Beer's law at least for D_{III} of 0.10-3 (B). These results gave the amt. of dye, q', in mol. cm.$^{-2}$ for D_{III} = 1. The absorption curve of III formed by development was found to be the same. Several unsensitized, standard emulsions, varying in mean grain size (IV) (3 NH_3 types, including sound and spectral, and one non-NH_3), were used. After const. exposure, a variable development time (0.5-3.5 min.) with standard developer gave a film which was cut in half. III in one half was bleached with dil. H_2SO_4 to give D_{Ag}; Ag in the other half was removed with $K_3Fe(CN)_6$ and $Na_2S_2O_3$ to give D_{III}. For $D_{III} = f(D_{Ag})$, which resembled the log illumination vs. D_{Ag} curve, from the linear portion with maximal II, ΔD_{Ag} was found for ΔD_{III} = 0.4, giving II = 6.5-4.3 for a IV radius of 0.40-0.31. The abs. mol. ratio $\varphi = \Delta Q/\Delta C$, where $\Delta Q = q'.\Delta D_{III}$, and $\Delta C = \rho'.\Delta D_{Ag}$ (ρ' is the photometric equiv. as g. atoms Ag cm.$^{-2}$ for each emulsion type), was 0.240-0.260, unaffected by IV, and agreeing with theory.

W. B. McCormack

IORDANSKIY, A.N.

USSR/Chemistry - Photography 1 May 52

"Dyestuff. Yield in Color Development," S. A. Bongard, A. N. Iordanskiy, V. S. Chel'tsov

"Dok Ak Nauk SSSR" Vol LXXXIV, No 1, pp 81-84

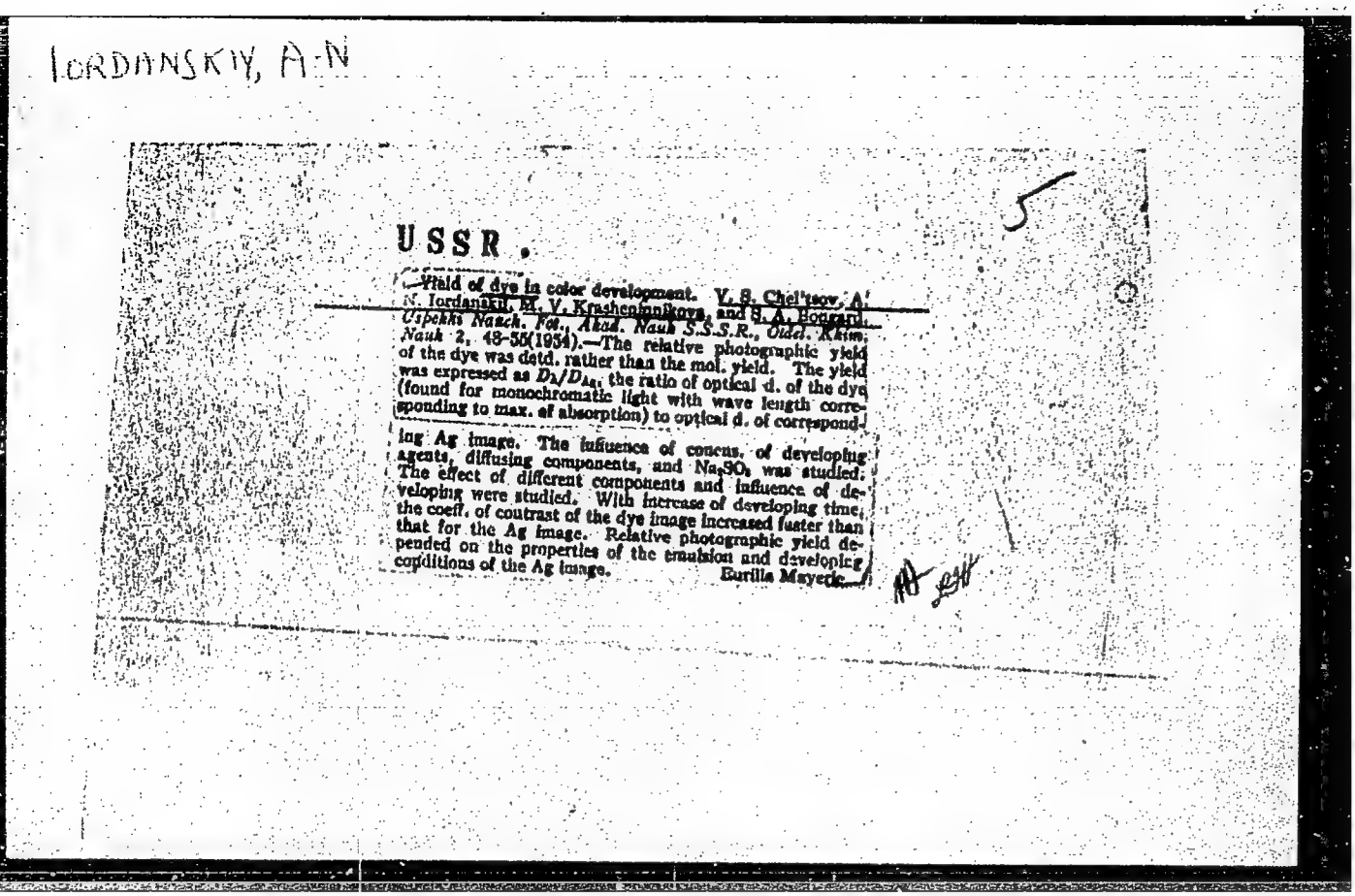
The relationship between the amts of silver and dyestuff formed during color development with dyestuff components of various classes was studied. As typical components, the following were chosen: for yellow derivs of anilide of an aroylacetic acid; purple, a compd of the pyrazalone series; blue a deriv of 1,2-hydroxynaphthalene carbonic acid contg a sulfonic acid group in the 4-position. The

224T6

relationship between the optical density of the dyestuff and its surface concn in the photographic layer was detd and found to be a linear function. In order to det the yield of dyestuff, which was found to be const throughout the development process, the relationship between the optical density of the depth of color and the surface concn of metallic silver formed during the development process was experimentally established. Presented by Acad A. N. Terenin 1 Mar 52.

224T6

IORDANSKIY, A-N



USSR.

Yield of dye in color development. V. S. Chel'tsov, A. N. Iordanskii, M. V. Krasheninnikova, and S. A. Bogorad. *Uspekhi Nauch. Fot., Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 2, 48-56(1954).—The relative photographic yield of the dye was detd. rather than the mol. yield. The yield was expressed as D_λ/D_{A_g}, the ratio of optical d. of the dye (found for monochromatic light with wave length corresponding to max. of absorption) to optical d. of corresponding Ag image. The influence of concns. of developing agents, diffusing components, and Na_2SO_3 was studied. The effect of different components and influence of developing were studied. With increase of developing time, the coeff. of contrast of the dye image increased faster than that for the Ag image. Relative photographic yield depended on the properties of the emulsion and developing conditions of the Ag image. Eurilla Mayerle.

IORDANSKIY, A. N., et al. and CHELZOV, V. S.

"On the Inter-Relation of the Optical Density of Silver and Dyestuff in Color Development," a paper given at the International Conference on Scientific Photography, Cologne, 24-27 Sep 1956

E-3072367

IORDANSKIY, A.N.

Influence of the structure of multilayer color photographic materials on their resolving power and on the sharpness of the image. Zhur.nauch. i prikl.fot.i kin. 1 no.1:52-55 Ja-F '56. (MLRA 9:10)

1.Vsesoyuznyy nauchno-issledovatel'skiy kino-fotoinstitut.
(Color cinematography)

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4E 4C
4E 2D

1909 771.534.554 : 771.356

Spectrozonal Photography. A. N. IORDANSKII. *Zh. nauch. priklad. Fotogr. Kinematogr.*, Jan.-Feb. 1957, 2, 28-34. [In Russian].—A method is described for calculating the difference in optical density of photographic images of two objects ($\Delta D\lambda^{a/b}$), [where $\Delta D\lambda^{a/b}$ is the difference between the two densities D^a and D^b]. Results are given for the calculation of the quantity $\Delta D\lambda^{a/b}$ for a number of objects typical of a summer landscape in relation to "forest plantations of deciduous species in the summer period". It is shown to be impossible to distinguish clearly all the objects studied in the summer landscape by photographing them with the aid of any monochromatic radiation within the range 400-840mμ. It is shown that one group of objects shows the best image in relation to the foliage on photographing with the aid of red radiation, while the other group requires the aid of infra-red radiation. It is shown that, for separate objects referred to the group in which the best image in relation to the foliage appears on photographing with the aid of infra-red radiation, an increase in the wavelength corresponding to more than 790 and 820 mμ leads to deterioration in their appearance. The principle of spectrozonal photography and the formulation of its basic requirements are discussed. S.C.G.

Translation of Author's Abstract.

RD add

IORDANSKIY, A.N.

USSR/Chemical Technology - Chemical Products and Their Application. Photographic Materials. I-6

Abs Jour : Ref Zhur - Khimiya, No 1, 1958, 2425

Author : Rozental', L.V., Iordanskiy, A.N.
Inst : -
Title : Black Antihalo Counterlayer of Color Motion Picture Films.

Orig Pub : Tekhnika kino i televideniya, 1957, No 7, 63-72

Abstract : Description of the properties of a black antihalo counterlayer consisting of a dispersion of finely dispersed carbon black having high colloidal stability, in cellulose acetophthalate. It is reported that deposition of such a counterlayer on the backing results in a sharp increase of the resolving power of the film without lowering its photographic, physical and mechanical characteristics.

Card 1/1

AUTHOR: Iordanskiy, A.N. SOV 77-3-4-7/23

TITLE: Spectrozonal Photography (Spektrozonal'naya fotografiya); II. Chromatic and Achromatic Density Detail as a Guide to the Mutual Exposure of Spectrozonal Images (Khromaticheskaya i akhromaticheskaya detali potemneniya - mera vzaimnogo vyyavleniya spe trozonal'nykh izobrazheniy)

PERIODICAL: Zhurnal nauchnoy i prikladnoy fotografii i kinematografii, 1958, Vol 3, Nr 4, pp 275-278 (USSR)

ABSTRACT: The author discusses the way a change in the spectral brightness factors of a pair of objects is reflected in a change in the optical density difference of their photographic images for both achromatic and chromatic film. He proposes the use of chromatic and achromatic density detail as a gage to the difference in the two-color spectral images of the objects and works out a mathematical method for calculating the values of the density detail, making use of the spectral brightness factors of the objects being photographed for two monochromatic radiations and two spectral zones. There are 2 figures and 2 Soviet references.

Card 1/2

SOV 77-3-4-7/23

Spectrozonal Photography; II Chromatic and Achromatic Density Detail as a Guide to the Mutual Exposure of Spectrozonal Images

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy kinofotoinstitut (All-Union Research Institute for Photography and Cinematography)

SUBMITTED: June 14, 1957

1. Photographic film--Performance 2. Photographic film--Properties
3. Mathematics--Applications

Card 2/2

CHEL'TSOV, V.S., kand.khim.nauk; BONGARD, S.A., kand.khim.nauk;
IORDANSKIY, A.N., kand.tekhn.nauk

Present-day methods of producing color photographs. Khim.nauk i prom. 3 no.5:576-587 '58. (MIRA 11:11)
(Color photography--Three-color process)

IORDANSKIY M. M.
p. 3.

PHASE I BOOK EXPLOITATION SOV/3815
SOV/7-M-7

Akademiya nauk SSSR. Laboratoriya aerometodov

Trudy, tom 7: Materialy VII Vsesoyuznogo mezhduvedomstvennogo soveshchaniya po aeros"yemke, 25 noyabrya - 1 dekabrya 1956 g. (Transactions of the Laboratory of Aerial Methods, Academy of Sciences USSR, Vol. 7: Materials of the 7th All-Union Interdepartmental Conference on Aerial Surveying) Moscow, 1959. 331 p. 1,400 copies printed.

Editorial Board: A.V. Glagolev, V.G. Zdanovich, N.G. Kell' (Resp. Ed.), D.M. Kudritskiy, K.S. Lyalikov, and G.G. Samoylovich; Ed. of Publishing House: D.M. Kudritskiy; Tech. Ed.: M.Ye. Zendel'.

PURPOSE: This collection of articles is intended for photogrammetrists. The articles will be of interest to all governmental and industrial agencies concerned with aerial photography.

COVERAGE: This is the first volume of a 2-volume work containing reports read at the All-Union Conference on Photogrammetry which took place in Leningrad from November 25 to December 1, 1956, under the auspices of the Laboratory of Aerial Photography Methods of the Academy of Sciences USSR. These reports

Card 1/15

describe the principles and applications of photo interpretation in the fields of soil science, forestry, geology, hydrology, industrial development, etc. Individual reports discuss the equipment used and techniques employed. References accompany each article.

TABLE OF CONTENTS:

S/081/61/000/022/057/076
B101/B147

AUTHORS: Kilinskiy, I. M., Iordanskiy, A. N.

TITLE: Influence of the yellow color filter layer on the resolving power and effective color sensitivity of color film layers

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 22, 1961, 381, abstract 22L338 (Tr. Vses. n.-i. kinofotoin-ta, no. 29, 1959, 59-61)

TEXT: The yellow filter layer containing colloidal Ag hardly reduces the resolving power of the green- and red sensitive layers of the color film, but slightly reduces its effective sensitivity to light. It is advisable to replace the layer with the colloidal Ag by a light filter having a higher transmissivity for green and red light. [Abstracter's note: Complete translation.]

Card 1/1

KILINSKIY, I.M.; IORDANSKIY, A.N.

Effect of silver halide concentration of the emulsion layer on its resolving capacity dependent on the nature of the developing agent. Zhur.nauch.i prikl.fot. i kin. 5 no.2:108-113 Mr-Ap '60. (MIRA 14:5)

1. Vsesoyuznyy nauchno-issledovatel'skiy kinofotoinstitut (NIKFI).
(Photography—Developing and developers)

VILENSKIY, Yu.B.; IORDANSKIY, A.N.; BUDARINA, N.N.

Some problems of the improvement of color reproduction and sharpness of positive color films. Usp. nauch. fot. 8:13-20 '62. (MIRA 17:7)

S/058/63/000/003/046/104
A062/A101

AUTHORS: Kilinskiy, I. M., Vilenskiy, Yu. B., Iordanskiy, A. N.

TITLE: On the improvement of light-sensitivity, resolving power and quality of color reproduction in color negative motion-picture films

PERIODICAL: Referativnyy zhurnal, Fizika, no. 3, 1963, 87, abstract 3D587 ("Uspekhi nauchn. fotogr.", 1962, v. 8, 3 - 12)

TEXT: The article describes new color films, produced by NIKFI and the Shostkin chemical plant. The increase of light sensitivity has been attained owing to a rational choice of the form of change in the quantity of excessive bromide in the ripening process of the emulsion. The results of work on sensitization of color photography materials, filter layer structure etc. are described. It is shown that an increase of sharpness in color images can be attained by a reduction of light scattering in the elementary layers, and an improvement of the color reproduction - by introducing into these layers masking components. Pecularities of the treatment of films with internal masking are described.

D. Balabukha

[Abstracter's note: Complete translation]

Card 1/1

S/058/63/000/003/047/104
A062/A101

AUTHORS: Vilenskiy, Yu. B., Iordanskiy, A. N., Budarina, N. N.

TITLE: Some problems in the improvement of color reproduction and sharpness in color positive films

PERIODICAL: Referativnyy zhurnal, Fizika, no. 3, 1963, 87, abstract 3D588 ("Uspekhi nauchn. fotogr.", 1962, v. 8, 13 - 20)

TEXT: Some problems in the improvement of color reproduction and image sharpness are considered, related to the properties of color positive materials. For improving the color separation it is proposed to use AgCl emulsions and more selective dyes, and for increasing the sharpness - to displace the components with respect to the sensitizers in the emulsion layers. A series of motion-picture materials, both from this country and from abroad, which meet these requirements are described.

D. Balabukha

[Abstracter's note: Complete translation]

Card 1/1

IORDANSKIY, A.N.

New spectrozonal negative films. Zhur. nauch. i prikl. fot. i kin. 9 no.3:210-211 My-Je '64. (MIRA 18:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy kinofotoinstitut (NIKFI). Submitted February 6, 1964.

IORDANSKIY, D.

Machine and speech. IUn.tekh. 5 no.3 25-28 Mr '61. (MIRA 14:6)

(Cybernetics) (Speech)

GADOMSKI, Yan; IORDANSKIY, D. [translator]

Colored stars. IUn.tekh. 5 no.4:54 Ap '61. (MIRA 14:3)
(Stars)

L 39892-66 EWT(d)/EWP(k)/EWP(h)/EWP(l)/EWP(v) RM/GD-2

ACC NR: AP6017694 SOURCE CODE: UR/0103/65/026/012/2289/2291

AUTHOR: Iordanskiy, D. I. 12B

ORG: none

TITLE: Problems of the control of large systems (Scientific conference held in Poland)

SOURCE: AN SSSR. Avtomatika i telemekhanika, v. 26, no. 12, 1965, 2289-2291

TOPIC TAGS: scientific conference, automatic control system, nervous system

ABSTRACT: The conference was held in November 1964 in Yablonna near Warsaw. 96 Polish specialists plus others from Bulgaria, Hungary and Yugoslavia attended. Reports were heard on the general problems involved in the control of large systems, the structure of large systems, the classification of large systems, adaptive optimization of hierarchically controlled large systems, reliability in large systems, the nervous system as an example of a large system, and biological receptors and associated nerve networks as an example of the inputs to a large system. Particular attention was paid to large-scale production processes. [JPRS]

SUB CODE: 13, 06 / SUBM DATE: none

Card 1/1 NLS UDC: 62-50:061.3

L 37107-66 EWP(c)/EWP(k)/EWT(d)/EWP(h)/EWP(l)/EWP(v) BC/JT/JXT(BF)/GD

ACC NR: AT6012883 SOURCE CODE: UR/0000/65/000/000/0020/0027

4:4
B+1

AUTHOR: Iordanskiy, D. I.

ORG: None

TITLE: Some problems of studying staffs controlling large systems

SOURCE: Sistema chelovek i avtomat (Man-automaton systems). Moscow, Izd-vo Nauka, 1965, 20-27

TOPIC TAGS: automatic control system, bionics, man machine communication, information theory

ABSTRACT: The author defines a large system as one containing people. Large systems must include people or be totally made up of people, and are divided into regular and irregular. An example is given depicting a regular system such as an automobile plant. Examples of irregular systems are mine construction, house building, and hydroelectric station construction. The function of staffs working in large irregular systems are not considered. A staff or collective is defined as the entire aggregate of people controlling a given large system. An example of such a staff or collective is the entire staff of a plant, hospital, or design bureau. The advantages of studying staffs in Communist and

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L 37107-66

ACC NR: AT6012883

Socialist countries are discussed. The staff is studied as a set. The effect of personnel on the function of large systems is studied. The staff is studied as a certain set apart from all other elements of a large system. It is essential to keep in mind that all the parts constitute a single whole. A set is given and a certain complex system K. Together they constitute a large system with n inputs $X = (x_1, x_2, \ldots, x_n)$ which are the controlling actions of people, and t outputs $Y = (y_1, y_2, \ldots, y_t)$ which are the operational indexes of the system K yields the mapping $X \to Y$. The staff A can be divided according to purpose.

Thus the staff of a large system which is the set A can be divided into groups such as A_1, $A_2, \ldots A_k$. These groups include people performing identical or near identical functions. Such a classification is useful in studying the part played by people in large systems as a function of their tasks. The groups $A_1, A_2, \ldots, A_k$ are called nonintersecting subsets. Overlapping of the boundaries is permissible. Various elements can also cross over. Thus

$$A = \bigcup_{i=1}^{k} A_i, \; A_i \cap A_j = 0 \text{ FOR ALL } i \neq j$$

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L 37107-66
ACC NR: AT6012883

It is shown that $A_i = \{a_{1i}, a_{2i}, \ldots, a_{pi}\}$, where $a_{ji} \in A$ are the elements of the initial set—staff

An example is given based on several parallel assembly lines where identical units are enabled. Each line includes workers performing identical operations. A graphic representation of this is given. An expression is given for the correlation coefficient. A dispersion of the respective magnitudes is presented. Two criteria should be considered in studying large systems: the extent to which enumerated and unenumerated characteristics of staffs are reflected in the operational indexes indices of large systems and the extent to which work conditions and characteristics of the systems themselves affect the material and psychological needs of the staff members. Orig. art. has: 6 figures and 10 formulas.

SUB CODE: 05/09/06 SUBM DATE: 02Aug65 / ORIG REF: 002

Card 3/3

SOV-98-58-2-6/21

AUTHORS: Karpov, A.N., and Iordanskiy, I.Ye., Engineers

TITLE: The Reconstruction of the Shores of the Tsimlyanskoye Water Reservoir (Pererabotka beregov Tsimlyanskogo vodokhranilishcha)

PERIODICAL: Gidrotekhnicheskoye stroitel'stvo, 1958, Nr 2, p 27 (USSR) FEB

ABSTRACT: To obtain factual material on the rebuilding of the shores of large water reservoirs, the profiles of shores consisting of various rock formations were studied at the Tsimlyanskoye Water Reservoir in 1953. The measuring of the shores at the selected sections was carried out for 3 years. Figures 1 and 2 show the results of the observations, which have led to the preliminary conclusion that it is possible to forecast the amount of ercsion of sandy shores. Little is known about the form of shores consisting of rocks which convert

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SOV-98-58-2-6/21

The Reconstruction of the Shores of the Tsimlyanskoye Water Reservoir

easily into a suspension state.
There are 2 diagrams.

1. Inland waterways--USSR 2. Beaches--Erosion

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IORDANSKIY, S.V.

40-4-3/24

AUTHOR: IORDANSKIY, S.V. (Moscow)

TITLE: On the Stability of a Plane Stationary Shock Wave (Ob ustoychivosti ploskoy statsionarnoy udarnoy volny).

PERIODICAL: Prikladnaya Mat.i Mekh., 1957, Vol.21, Nr 4, pp.465-472 (USSR)

ABSTRACT: A plane piston is assumed to move with constant velocity in the direction of the negative x-axis in a homogeneous medium. The author considers the perturbations of the hydrodynamic parameters behind the front of the arising shock wave. In linear approximation there hold the equations

(1) $\frac{\partial \vec{u}}{\partial t} = -V \operatorname{grad} \pi$, $\frac{\partial \pi}{\partial t} + \frac{c^2}{V} \operatorname{div} \vec{u} = 0$, $\frac{\partial \sigma}{\partial t} = 0$

in a coordinate system moving with the shock wave, where V is the resting specific volume and $\pi, \vec{u}, \sigma$ are small perturbations of pressure, velocity and entropy behind the shock-wave front; c is the velocity of sound. Let the equation of the front surface be

(2) $$x = -vt + \zeta(y,z,t)$$

where ζ denotes the perturbation of the surface. From (1) it follows

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$$\frac{\partial^2 \pi'}{\partial t^2} - c^2 \frac{\partial^2 \pi'}{\partial x^2} + k^2 c^2 \pi' = 0$$

The boundary conditions are given by D'yakov's linear approximations (Zh.E.T.F.,27,3,1954). For ζ it holds:

$$\frac{d\zeta}{ds} = \frac{d\zeta}{ds}\Big|_\Gamma - \mu \int_0^\infty U(s-w) J_0(s-w) \left(\frac{d^2\zeta}{dw^2} + \nu\zeta\right) dw + F + \tag{3}$$

$$+ \int_0^\infty U(s-a-b) \left\{ \alpha f_1 J_0'(f) \frac{d\zeta}{dw} - \mu J_0(f) \left(\frac{d^2\zeta}{dw^2} + \nu\zeta \right) \right\} dw$$

Here it is $\alpha = \frac{c-v}{c+v}$, $s = \sqrt{\alpha} k \xi_0$, $\mu = \frac{c}{2v}(1-j)$, $\xi = ct-x$, $\nu = \frac{vv_0}{c^2-v^2} \frac{1+j}{1-j}$, $L = \frac{2lk}{\sqrt{\alpha}}$ (l describes the position of the piston for t=0), $\Gamma = \alpha s - L$, $f = \sqrt{(s-a)^2 - b^2}$, $f_1 = -\frac{1}{2}\sqrt{\frac{s-a-b}{s-a+b}} +$

$+ \frac{1}{2\alpha^2}\sqrt{\frac{s-a+b}{s-a-b}}$, $a = \frac{1+\alpha^2}{2\alpha} w + L \frac{1-\alpha}{2}$, $b = \frac{1-\alpha^2}{2\alpha} w + L \frac{1+\alpha}{2}$,

CARD 2/3 $U(\varsigma) = 1$ for $\varsigma > 0$, $U(\varsigma) = 0$ for $\varsigma < 0$, F is a certain

On the Stability of a Plane Stationary Shock Wave 40-4-3/24

known function of the initial values, J_o is the Bessel function. For a gas extending at infinity behind the shock wave it is $l=\infty$ and the initial perturbations vanish for $x > h$. Then instead of (3) it holds:

$$(4) \quad \frac{d\zeta}{ds} = -\mu \int_0^{\infty} U(s-w)J_o(s-w)\left(\frac{d^2\zeta}{dw^2} + \nu\zeta\right)dw + F$$

From this with the aid of Laplace transformations the author obtains the stability conditions and an asymptotic law for the attenuation of the perturbations. The influence of the reflection on the surface of the piston is equally considered.

SUBMITTED: March 12, 1957

AVAILABLE: Library of Congress

CARD 3/3

10(4), 24(3) SOV/20-121-4-10/54

AUTHOR: Iordanskiy, S. V.

TITLE: Zemplen's Theorem in Magnetic Hydrodynamics (Teorema Tsemplena v magnitnoy gidrodinamike)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 121, Nr 4, pp 610-612 (USSR)

ABSTRACT: The discontinuities of the shock wave type (where the matter passes through the discontinuity surface and where the thermodynamic quantities are varied) are very interesting. L. D. Landau and Ye. M. Lifshits show in their book (Ref 2) that only compression waves are possible under such conditions (just as in the case of ordinary shock waves). This paper proves this assumption for any values of the discontinuities. First the equations for the discontinuities of the shock wave type are given in an explicit form. The author investigates only substances for which there is $\left(\frac{\partial^2 p}{\partial V^2}\right)_S = 0$, $\left(\frac{\partial p}{\partial S}\right)_V > 0$, p denotes the pressure, V - the specific volume, The above mentioned equations describe any pos-

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sible kind of shock waves in magnetic hydrodynamics. Next, the author deduces an equation for the curves $p_2(V_2)$ of the Hugoniot (Gyugonio) type. This equation has 3 solutions which, in the case of weak discontinuities, are real solutions and correspond to 3 different Hugoniot curves $p_2(V_2)$. But in the case $H_1 \neq 0$ this equation has only one real radical if p_2 is sufficiently high. The entroy S_2 increases in a monotonous way along any of these Hugoniot curves and there is always $p_2 > p_1$. The proof of this assertion is analogous to the corresponding proof of ordinary gas dynamics. The Hugoniot function is then given and discussed. dS_2 does not change its sign along the Hugoniot curve if certain conditions (which are given by the author) are satisfied. The entropy S_2 and the Hugoniot potential have their maximum in the same points. There are 3 references, 3 of which are Soviet.

PRESENTED: March 29, 1958, by M. A. Lavrent'yev, Academician

SUBMITTED: March 27, 1958

FOR DANSKIY, S.V.

PHASE I BOOK EXPLOITATION SOV/3762

Konferentsiya po magnitnoy gidrodinamike. Riga, 1958.

Voprosy magnitnoy gidrodinamiki i dinamiki plazmy; trudy Konferentsii. (Problems in Magnetohydrodynamics and Plasma Dynamics; Transactions of a Conference) Riga, Izd-vo AN Latviyskoy SSR, 1959. 343 p. Errata slip inserted. 1,000 copies printed.

Sponsoring Agency: Akademiya nauk Latviyskoy SSR. Institut fiziki.

Editorial Board: D.A. Frank-Kamenetskiy, Doctor of Physics and Mathematics, Professor; A.I. Vol'dek, Doctor of Technical Sciences, Professor; I.M. Kirko, Doctor of Physics and Mathematics; V.Ya. Veldre, Candidate of Physics and Mathematics; V.G. Vitol, Candidate of Physics and Mathematics; Yu.M. Krumin'; and V.Ya. Kravchenko.

Ed.: A. Taytel'baum; Tech. Ed.: A. Klyavinya

PURPOSE: This book is intended for physicists working in the field of magnetohydrodynamics and plasma dynamics.

COVERAGE: This volume contains the transactions of a conference held in Riga, June 1958, on problems in applied and theoretical magnetohydrodynamics. The objects of the conference were the investigation of the basic trends in theoretical and applied magnetohydrodynamics, establishing contact between the people doing research in different branches of magnetohydrodynamics, and promoting the participation of theoretical physicists in problems in applied magnetohydrodynamics. More than 160 persons from different parts of the Soviet Union took part in the conference, and 55 papers were read. Similar conferences are to be held regularly in the future; the next such conference is scheduled to be held in Riga in June 1960. In this present collection of the transactions of the conference, most of the papers and comments on papers are presented by the authors themselves in an abridged form. The book is divided into two parts: the first part deals with problems in theoretical magnetohydrodynamics and plasma dynamics, and consists of 35 articles on such aspects of the problem as the application of magnetohydrodynamics in astrophysics (D.A. Frank-Kamenetskiy), magnetohydrodynamics and the investigation of cosmic-ray variations (L.I. Dorman), acceleration of plasma in a magnetic field (G.V. Gordeyev and A.I. Gubanov), stability of shock waves and magnetohydrodynamics (A.I. Akhiyezer). The second part, consisting of 33 articles, deals with problems of experimental magnetohydrodynamics, including the application of physical simulation for investigation of electromagnetic processes in liquid metals (I.M. Kirko) and the development of electromagnetic pumps (P.G. Kirillov), at the Institute of Physics of the Academy of Sciences, Latvian SSR. Several articles are devoted to induction pumps, electromagnetic crucibles, electromagnetic stirrers for molten metals, and their application in the metallurgical industry including schematic diagrams of their power-supply systems. References are given at the end of most of the articles.

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10 (2)

AUTHOR: Iordanskiy, S. V.

SOV/20-125-6-9/61

TITLE: On the Asymptotic Form of the Axially Symmetric Expanding Wave in a Heavy Fluid (Ob asimptotike osesimmetrichnoy raskhodyashcheysya volny v tyazheloy zhidkosti)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 125, Nr 6, pp 1211-1214 (USSR)

ABSTRACT: The present paper deals with the asymptotic form of an outgoing wave at large distances from the symmetry axis on the assumption of axial symmetry. The depth of the fluid is assumed to be finite, and the motion of the fluid as being a potential motion. For the velocity potential it holds that $\frac{\partial^2 \varphi}{\partial z^2} + \Delta\varphi = 0$, where the z-axis is perpendicular in an upward direction. The boundary conditions on the bottom, which is assumed to be plane, is $\frac{\partial \varphi}{\partial z} = 0$ with $z = 0$. On the free surface the following conditions must be satisfied: $\frac{\partial \varphi}{\partial t} + \frac{1}{2}(\nabla\varphi)^2 + \frac{1}{2}\left(\frac{\partial \varphi}{\partial z}\right)^2 + g\xi = F(t)$ (Bernoulli-equation) and

Card 1/3

$\frac{\partial \xi}{\partial t} + \nabla\xi \cdot \nabla\varphi = \frac{\partial \varphi}{\partial z}$ (kinematic condition). Here ∇ denotes the gradient in the x,y-plane. The required equations are developed by expansion of φ with respect to powers of z. By using the condition which holds for the bottom,

$\varphi = \varphi_0(x, y, t) - \frac{1}{2} z^2 \Delta\varphi_0 + \frac{1}{24} z^4 \Delta\Delta\varphi_0 + \ldots$ is obtained by means of the Laplace equation. This representation for φ is correct if the characteristic length L in the x,y-plane is much greater than ξ, which is assumed in this case. The author then introduces dimensionless variables and obtains an approximated equation for φ. He then endeavors to find the waves which satisfy the conditions given here and the form of which is asymptotically stable at $t \longrightarrow \infty$. On this occasion, the waves in the channel $\varphi = \varphi(x, t)$ are first investigated. In first approximation there exist waves of arbitrary shape $\varphi_1 = f(x-t)$. The author then puts $\varphi = f(x-t) + \varphi_2$, where φ_2 is a high-order small quantity. In φ_2 a secular term

On the Asymptotic Form of the Axially Symmetric Expanding Wave in a Heavy Fluid

SOV/20-125-6-9/61

occurs, which increases infinitely with increasing $\eta = x + t$. Thus, the terms of higher order may, after a sufficiently long time, completely change the shape of the original current wave. In conclusion, an asymptotic representation for the velocity of the fluid in a wave is written down. In a similar manner it is possible to investigate the asymptotic form of waves in a fluid of variable depth if this depth varies sufficiently slowly. There are 4 Soviet references.

ASSOCIATION: Matematicheskiy institut im. V. A. Steklova Akademii nauk SSSR (Mathematics Institute imeni V. A. Steklov of the Academy of Sciences, USSR)

PRESENTED: December 31, 1958, by M. A. Lavrent'yev, Academician

SUBMITTED: December 27, 1958

Card 3/3

16(1) SOV/20-127-3-7/71

AUTHOR: Iordanskiy, S.V.

TITLE: A Solution of the Cauchy Problem for the Kinetic Equation of Electron Plasma

PERIODICAL: Doklady Akademii nauk SSSR,1959,Vol 127,Nr 3,pp 509-512 (USSR)

ABSTRACT: According to Landau [Ref 1] the kinetic equation for an electron plasma without collisions (the magnetic field is equal to zero) can be written in the form

$$(1) \quad \frac{\partial n}{\partial t} + v\frac{\partial n}{\partial x} - \frac{e}{m} E(x,t) \frac{\partial n}{\partial v} = 0 ,$$

where E is determined from

$$(2) \quad \frac{\partial E}{\partial x} = -4\pi e \left\{ \int_{-\infty}^{\infty} n(v,x,t)dv - N_o \right\} ;$$

here e and m are charge and mass of the electron, N_o the density of the positive ions assumed to be constant. For (1) - (2) the author poses the Cauchy problem

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A Solution of the Cauchy Problem for the Kinetic Equation of Electron Plasma

SOV/20-127-3-7/71

$$n\Big|_{t=0} = f(x,v) \quad , \quad \lim_{x\to-\infty} E = 0$$

where $f(x,v) > 0$ is a continuous function.
Theorem: The solution of (1) - (2) with these conditions exists for every continuous $f(x,v)$ which satisfies the conditions

$$\int_{-\infty}^{\infty} \left\{ \int_{-\infty}^{\infty} f(x,v)dv - N_0 \right\} dx = 0$$

$$|f(x,v) - N(v)| < K(v)\varphi(x) \qquad (0 < N(v) < K(v))$$

where

$$N(v) = \lim_{x\to\pm\infty} f(x,v) \qquad \left(N_0 = \int_{-\infty}^{\infty} N(v)dv\right)$$

$\varphi(x)$ is bounded and $K(v)$ decreases monotonely with increasing $|v|$ so that

Card 2/3

A Solution of the Cauchy Problem for the Kinetic Equation of Electron Plasma

SOV/20-127-3-7/71

$$\int_{-\infty}^{\infty} v^2 K(v)dv < \infty \quad , \quad \int_{-\infty}^{\infty} \varphi(x)dx < \infty$$

The solution is unique in the class of bounded functions satisfying the Lipschitz condition on the whole x-axis, vanishing for $x \to \pm \infty$ and possessing a continuous partial derivative with respect to x.
There are 2 Soviet references.

ASSOCIATION: Matematicheskiy institut imeni V.A. Steklova Akademii nauk SSSR (Mathematical Institute imeni V.A. Steklov, AS USSR)

PRESENTED: April 10, 1959, by M.A. Lavrent'yev, Academician

SUBMITTED: April 1, 1959

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IORDANSKIY, S.V. (Moskva)

Equations of motion for a liquid containing gas bubbles.
PMTF no.3:102-110 S-O'60. (MIRA 14:7)
(Differential equations, Partial)
(Hydrodynamics)

10.3200
26.5200

27791
S/508/60/028/000/002/022
D237/D305

AUTHORS: Iordanskiy, S.V., and Shmyglevskiy, Yu.D. (Moscow)

TITLE: Sublimation of an axially symmetric blunt body near the stagnation point of incident gas flow

PERIODICAL: Akademiya nauk SSSR. Otdeleniye tekhnicheskikh nauk. Inzhenernyy sbornik, v. 28, 1960, 26 - 35

TEXT: The authors obtain here the equations of an axially symmetric laminar boundary layer for a 2-component gas at low temperatures with diffusion present. Boundary conditions are derived for the case of sublimation, and the method is given for calculating sublimation flow and velocity near the stagnation point. Finally solid CO_2 in the stream of air is considered as an example. According to L.D. Landau and Ye.M. Livshits (Ref. 2: Mekhanika sploshnykh sred (Mechanics of Continuous Media) Gostekhizdat, M. 1954) the flow of multi-component gas is described by

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Sublimation of an axially ...

$$\left.\begin{aligned} &\frac{\partial \rho w_i}{\partial x_i} = 0, \\ &\frac{\partial \rho c_\alpha w_i}{\partial x_i} + \frac{\partial j_{i\alpha}}{\partial x_i} = 0, \\ &\rho w_k \frac{\partial w_i}{\partial x_k} = -\frac{\partial p}{\partial x_i} + \frac{\partial \sigma_{ik}}{\partial x_k}, \\ &\frac{\partial}{\partial x_i}\left[\rho\left(\frac{w^2}{2} + h\right) w_i - w_k \sigma_{ik} + q_i\right] = 0, \end{aligned}\right\} \tag{1.1}$$

$$p = p(\rho, T, c_1, c_2, \ldots). \tag{1.2}$$

$$j_{i\alpha} = -\rho D_\alpha \left(\frac{\partial c_\alpha}{\partial x_i} + \frac{k_T^{(\alpha)}}{T}\frac{\partial T}{\partial x_i} + \frac{k_p^{(\alpha)}}{p}\frac{\partial p}{\partial x_i}\right), \tag{1.3}$$

$$q_i = [k_T^{(\alpha)} M_\alpha - TM_\alpha' + \mu_\alpha] j_{i\alpha} - \varkappa \frac{\partial T}{\partial x_i},$$

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Sublimation of an axially ...

$$\sigma_{ik} = \eta\left(\frac{\partial w_i}{\partial x_k} + \frac{\partial w_k}{\partial x_i} - \frac{2}{3}\delta_{ik}\frac{\partial w_l}{\partial x_l}\right) + \zeta\delta_{ik}\frac{\partial w_l}{\partial x_l}; \qquad (1.3)$$

For two-component gas (1.1) and (1.3) are transformed into cylindrical coordinates by $x_1 = x$, $x_2 = x\cos\vartheta$, $x_3 = r\sin\vartheta$ and the equations of axial flow in (x, r) plane are derived in an (s, n) orthogonal coordinate system associated with the surface AB of the body (Fig. 1). The partials are then

$$\frac{\partial}{\partial x} = \frac{\mathfrak{R}\cos\gamma}{\mathfrak{R}+n}\frac{\partial}{\partial s} - \sin\gamma\frac{\partial}{\partial n}, \quad \frac{\partial}{\partial r} = \frac{\mathfrak{R}\sin\gamma}{\mathfrak{R}+n}\frac{\partial}{\partial s} + \cos\gamma\frac{\partial}{\partial n},$$

where R = radius of curvature, γ = angle between tangent to AB and x-axis at the given point. Tangential and normal velocities u and v are given by

$$w_r = u\sin\gamma + v\cos\gamma, \quad w_x = u\cos\gamma - v\sin\gamma.$$

Then for a small velocity of sublimation

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$$\left.\begin{aligned}
&\frac{\partial r\rho u}{\partial s}+\frac{\partial r\rho v}{\partial n}=0,\\
&\rho u\frac{\partial c}{\partial s}+\rho v\frac{\partial c}{\partial n}=\frac{\partial}{\partial n}\rho D\left(\frac{\partial c}{\partial n}+\frac{k_T}{T}\frac{\partial T}{\partial n}\right),\\
&\rho u\frac{\partial u}{\partial s}+\rho v\frac{\partial u}{\partial n}=-\frac{dp}{ds}+\frac{\partial}{\partial n}\eta\frac{\partial u}{\partial n},\\
&\frac{\partial p}{\partial n}=0 \text{ или } p=p(s),\\
&\rho u\frac{\partial}{\partial s}\left(h+\frac{u^2}{2}\right)+\rho v\frac{\partial}{\partial n}\left(h+\frac{u^2}{2}\right)=\frac{\partial}{\partial n}\left\{\eta\frac{\partial}{\partial n}\frac{u^2}{2}+\right.\\
&\left.+\varkappa\frac{\partial T}{\partial n}+\rho D(h_\alpha-h_\beta+k_TM)\left(\frac{\partial c}{\partial n}+\frac{k_T}{T}\frac{\partial T}{\partial n}\right)\right\},
\end{aligned}\right\} \qquad (1.4)$$

is obtained, where M = Mα + Mβ. For low temperature work in the absence of chemical reactions,

$$p = mR\left(\frac{c}{m_\alpha}+\frac{1-c}{m_\beta}\right)\rho T,\quad h = ch_\alpha + (1-c)h_\beta,$$

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Sublimation of an axially ...

can be utilized, where c is independent of o and T. Boundary conditions when gas α flows around a body β are for $\lambda = \infty$,

$$f_\lambda(\xi, \infty) = 1 \quad (2.1), \qquad T(\xi, \infty) = T_e(\xi), \; c(\xi, \infty) = c_e(\xi), \qquad (2.2)$$

where $T_e(\xi)$ and $c_e(\xi)$ are the temperature and concentration of α and for $\lambda = 0$

$$f_\lambda(\xi, 0) = 0 \quad (2.3), \qquad T(\xi, 0) = T_w(p_e(\xi)) \qquad (2.9)$$

and

$$\left.\begin{aligned} &\left[(2\xi f_\xi + f)c + \frac{L}{P}\left(c_\lambda + \frac{k_T}{T}T_\lambda\right)\right]_{\lambda=0} = 0, \\ &\left[(2\xi f_\xi + f)(Q - ck_T M) + \frac{c_p}{P}T_\lambda\right]_{\lambda=0} = \frac{q_T\sqrt{2\xi}}{ru_e\rho_w\mu_w} \end{aligned}\right\} \qquad (2.11)$$

where $Q = [h_\beta(T_w)]_{+0} - [h_\beta(T_w)]_{-0}$ = heat of sublimation of unit mass of β at the temperature T_w. Flow near the axis of symmetry is

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Sublimation of an axially ...

solved where the solution can be expressed in the form of a power series in $\sqrt{\xi}$ with coefficients dependent on λ, if $p_e(\xi)$ can also be expanded in powers of $\sqrt{\xi}$. Terms independent of ξ will then give a solution on the axis of symmetry. In dimensionless magnitudes

$$t=\frac{T}{T_{e|t=0}},\quad H=\frac{m_a(h_a-h_\beta)}{mRT_{e|t=0}},\quad \gamma=\frac{m_a c_p}{mR},$$

$$\Phi=lf_\lambda,\ F=f_\lambda,\ K=\frac{Ll}{p}\left(c_\lambda+\frac{k_T}{T}T_\lambda\right)$$

$$E=\frac{l_T}{p}t_\lambda+K(H+k_TM).$$

$$\Phi_\lambda=-f\frac{\Phi}{T}-\frac{1}{2}\left(\frac{\rho_e}{\rho}-F^2\right),$$
$$F_\lambda=\frac{\Phi}{T},\ f_\lambda=F, \qquad (3.1)$$

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$$t_\lambda = \frac{P}{l\gamma}\left\{E - K\left[H + k_T \frac{m_\beta(1-c) + m_\alpha c}{m_\beta c(1-c)}\, t\right]\right\}, \qquad (3.1)$$
$$c_\lambda = \frac{PK}{Ll} - \frac{k_T}{l} t_\lambda,\ K_\lambda = -fc_\lambda,$$
$$E_\lambda = -f(Hc_\lambda + \gamma t_\lambda).$$

is obtained and the boundary conditions (2.1)-(2.3), (2.9) and (2.11) become

$$\left.\begin{aligned} &F(0) = 0,\ t(0) = 1,\ K(0) = -f(0)c(0), \\ &E(0) = -f(0)[\bar{Q} + H(0)c(0)], \\ &F(\infty) = 1,\ t_\infty = \frac{T_e}{T_w},\ c(\infty) = 1, \end{aligned}\right\} \qquad (3.2)$$

where $\bar{Q} = \dfrac{m_\alpha Q}{mRT_\omega}\Big|_{\xi=0}$, $\qquad Q = \dfrac{mRT_w^2}{p_e}\dfrac{dp_e}{dT_w}$.

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Sublimation of an axially ...

For flow without diffusion (3.1) can be used if its 5th and 6th equations are replaced by

$$K(\lambda) = 0, \quad c = \begin{cases} 0 \text{ when } f < 0, \\ 1 \text{ when } f > 0, \end{cases}$$

and for the flow without sublimation (3.1) can be used with the boundary conditions

$$F(0) = 0, \ t(0) = 1, \ f(0) = 0, \ c(0) = 1,$$
$$F(\infty) = 1, \ t(\infty) = T_e/T_\omega, \ c(\infty) = 1,$$

where T_w = given temperature. The problem of the flow of air M = 6.2 around the body composed of solid CO_2 is solved as an example. There are 3 figures and 11 references: 3 Soviet-bloc and 8 non-Soviet-bloc. The 4 most recent references to the English-language publications read as follows: J.A. Fay, R.F. Riddel, Theory of Stagnation Point Heat Transfer in Dissociated Air, J. Aeron. Sci. vol. 25, No. 2, 1958; Tables of Thermal Properties of Gases, US. Department of Commerce National Bureau of Standards, Circular 564.

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Sublimation of an axially ...

1956; R. Bromberg, R. Lipkis, Heat Transfer in Boundary Layers with Chemical Reactions due to Mass Addition, Jet Propulsion, vol. 28, no. 10, 1958.

SUBMITTED: May 25, 1959

Fig. 1.

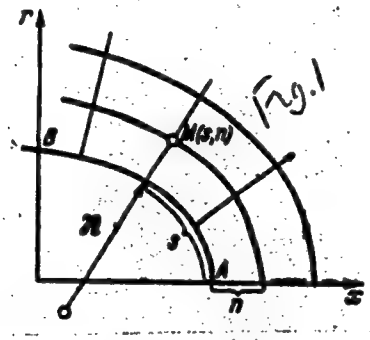

Fig.1

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S/517/61/...
B112/B125

16.3500 24.2120

AUTHOR: Iordanskiy, S. V.

TITLE: Cauchy's problem for a kinetic equation of plasma

SOURCE: Akademiya nauk SSSR. Matematicheskiy institut. Trudy. v. 60, 1961, 181 - 194

TEXT: The author considers the boundary value problem:

$$\partial n/\partial t + v\partial n/\partial x - (e/m)E(x,t)\partial n/\partial v = 0 \quad (1.1)$$

$$\partial E/\partial x = -4\pi e\left(\int_{-\infty}^{\infty} n(v,x,t)dv - n_o\right), \quad (1.2)$$

$$n|_{t=0} = f(x,v) > 0, \quad \lim_{x\to-\infty} E = 0. \quad (1.3), (1.4)$$

He obtains the following principal result: If the continuous function $f(x,v) > 0$ fulfills the conditions

$$\int_{-\infty}^{\infty}\left[\int_{-\infty}^{\infty} f(x,v)dv - n_o\right]dx = 0, \quad f(x,v) < K(v), \quad \int_{-\infty}^{\infty} v^2K(v)dv < \infty,$$

where $K(v)$ is a monotonically decreasing function of $|v|$, then the problem (1.1) - (1.4) will be unambiguously solvable. Finally, the author

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B112/B125

Cauchy's problem for a kinetic equation ...

generalizes his results for the case of a plasma with more than one components. There are 5 references: 4 Soviet and 1 non-Soviet.

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24, 2190 (1049, 1141)
26.2330

S/057/61/031/005/006/020
B104/B205

AUTHOR: Iordanskiy, S. V.

TITLE: Electron oscillations of plasma between two electrodes

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 31, no. 5, 1961, 549-556

TEXT: The author studied the stability of an electron plasma between two plane, infinitely large electrodes, one of which is traversed by a beam of electrons. A similar theoretical study was performed by Bohm et al. (Phys. Rev., 79, 992, 1950). Looney et al. (Phys. Rev., 93, 915, 1954) obtained experimental results which agree more or less with the data found here. In his experiments, the present author proceeded from the assumption of a high oriented electron velocity compared to the thermal velocities in the electron beam and in the plasma. If also the characteristic dimension is supposed to be large compared to the Debye radius, the problem can be treated as a problem of "cold plasma" in hydrodynamic approximation. The author confines himself to one-dimensional oscillations and proceeds from the system

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Electron oscillations...

$$\left.\begin{aligned}
&\frac{\partial N}{\partial t}+\frac{\partial}{\partial x}NV=0,\\
&\frac{\partial V}{\partial t}+V\frac{\partial V}{\partial x}=-\frac{e}{m}\frac{\partial\varphi}{\partial x},\\
&\frac{\partial n}{\partial t}+\frac{\partial}{\partial x}nv=0,\\
&\frac{\partial v}{\partial t}+v\frac{\partial v}{\partial x}=-\frac{e}{m}\frac{\partial\varphi}{\partial x},\\
&\frac{\partial^2\varphi}{\partial x^2}=-4\pi e\,(n+N-N_+),
\end{aligned}\right\} \quad (1)$$

where N and V stand for the density and velocities, respectively, of the electrons in the beam; n and v are the analogous quantities in the plasma; N_+ is the given density of positive ions; φ is the potential of the electric field, e is the electron charge, and m is the electron mass. In the following, the author considers only the case where a given potential, $-\varphi_1$, which is negative with respect to the plasma, is applied to the

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Electron oscillations...

electrodes A and B. In this case, ion layers are formed on the electrodes, in which there are no plasma electrons if $e\varphi_1 \gg kT_e$. System (1) has steady solutions so that outside the ion layers the plasma is electrically neutral; the quantities $N = N_0$, $n = n_0$, $V = V_0$ are constant and $\partial\varphi/\partial x = v = 0$. Inside the ion layers, these quantities are a function of x. Provided the plasma potential is equal to zero ($mV^2/2 \gg e\varphi_1$), N, n, and V are also constant inside the ion layers. With an ion layer of thickness δ and an electrode spacing l, the problem consists in examining the small perturbations of the steady solutions of (1). One obtains $N = N_0 + N'$, $V = V_0 + V'$, $n = n_0 + n'$, $v = v'$, and $\varphi = \varphi_0 + \varphi'$. System (1) is linearized, and for the interior of the ion layers one finds the system

$$\left.\begin{aligned} &\frac{\partial N'}{\partial t} + \frac{\partial}{\partial x}(N_0V' + V_0N') = 0, \\ &\frac{\partial V'}{\partial t} + V_0\frac{\partial V'}{\partial x} = -\frac{e}{m}\frac{\partial\varphi'}{\partial x}, \\ &\frac{\partial^2\varphi'}{\partial x^2} = -4\pi eN' \end{aligned}\right\} \qquad (3)$$

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Electron oscillations...

For the interior of the plasma, an analogous system is obtained in the same way. When solving these linearized systems, it is necessary to account for the altered boundary conditions

$$\varphi'|_{x=0}+\frac{\partial\varphi_0}{\partial x}\Big|_{x=0}\zeta_\lambda=\varphi'|_{x+0}+\frac{\partial\varphi_0}{\partial x}\Big|_{x+0}\zeta_\lambda,$$
$$\frac{\partial\varphi'}{\partial x}\Big|_{x=0}+\frac{\partial^2\varphi_0}{\partial x^2}\Big|_{x=0}\zeta_\lambda=\frac{\partial\varphi'}{\partial x}\Big|_{x+0}+\frac{\partial^2\varphi_0}{\partial x^2}\Big|_{x+0}\zeta_\lambda. \qquad (A)$$

It is shown that the problem concerning the stability of the steady solution results in the determination of eigenvalues λ at which solutions to the above-mentioned linearized systems exist in the form $e^{\lambda t}f(x)$. These solutions satisfy the boundary conditions

$$\left.\begin{aligned}\varphi'|_{x=0}=\varphi'|_{x+0},\ \frac{\partial\varphi'}{\partial x}\Big|_{x=0}+4\pi en_0\zeta_\lambda=\frac{\partial\varphi'}{\partial x}\Big|_{x+0},\\ N'|_{x=0}=N'|_{x+0},\ V'|_{x=0}=V'|_{x+0},\ \frac{d\zeta_\lambda}{dt}=v'|_{x+0}.\end{aligned}\right\} \qquad (5)$$

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$$\left.\begin{aligned} &\varphi'|_{l-\delta+0}=\varphi'|_{l-\delta-0},\ \left.\frac{\partial\varphi'}{\partial x}\right|_{l-\delta+0}+4\pi e n_0\zeta_B=\left.\frac{\partial\varphi'}{\partial x}\right|_{l-\delta-0},\\ &N'|_{l-\delta+0}=N'|_{l-\delta-0},\ V'|_{l-\delta+0}=V'|_{l-\delta-0},\ \frac{d\zeta_B}{dt}=v'|_{l-\delta-0}. \end{aligned}\right\} \quad (6)$$

and

$$\left.\begin{aligned} &\varphi'|_0=\varphi'|_l=0 \quad \text{(заданный потенциал электродов)},\\ &N'|_0=V'|_0=0 \quad \text{(заданный пучок на электроде } A\text{)}. \end{aligned}\right\} \quad (7)$$

If the desired functions which are multiplied by $e^{-\lambda t}$, are indicated by the same letters but without primes, the following systems of ordinary differential equations will be obtained for both regions:

$$\left.\begin{aligned} &\lambda N+V_0\frac{dN}{dx}+N_0\frac{dV}{dx}=0,\\ &\lambda V+V_0\frac{dV}{dx}+\frac{e}{m}\frac{d\varphi}{dx}=0,\\ &\frac{d^2\varphi}{dx^2}=-4\pi eN \end{aligned}\right\} \quad (8)$$

$(0\leqslant x\leqslant\delta,\ l-\delta\leqslant x\leqslant l)$;

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and

$$\left.\begin{aligned}
&\lambda N + V_0\frac{dN}{dx} + N_0\frac{dV}{dx} = 0,\\
&\lambda V + V_0\frac{dV}{dx} + \frac{e}{m}\frac{d\varphi}{dx} = 0,\\
&\lambda v = -\frac{e}{m}\frac{d\varphi}{dx},\\
&\lambda n + n_0\frac{dv}{dx} = 0,\\
&\frac{d^2\varphi}{dx^2} = -4\pi e(N+n)\\
&(l-\delta \geqslant x \geqslant \delta).
\end{aligned}\right\} \qquad (8)$$

By eliminating the quantities V, φ, n, and v from these systems, N is given by the expressions

$$N = B_1 e^{\gamma_1 x} + B_2 e^{\gamma_2 x} \quad (0 \leqslant x \leqslant \delta),$$
$$N = A_1 e^{\gamma_1 x} + A_2 e^{\gamma_2 x} \quad (l-\delta \leqslant x \leqslant l),$$
$$N = C_1 e^{\alpha_1 x} + C_2 e^{\alpha_2 x} \quad (\delta \leqslant x \leqslant l-\delta),$$

where

$$\gamma_{1,2} = -\frac{\lambda}{V_0} \pm \frac{i\omega}{V_0}, \quad \alpha_{1,2} = -\frac{\lambda}{V_0} \pm \frac{i\omega}{V_0\sqrt{1+\frac{\Omega^2}{\lambda^2}}}. \qquad (12)$$

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Then, it is possible to derive the corresponding relations for the other desired quantities, N, V, and φ, with the aid of which the eigenvalues λ are found from the boundary conditions for the present problem. This is, as a rule, a very cumbersome procedure. For $N = 0$ the eigenvalues are given by $\lambda = \pm i\Omega\sqrt{2\delta/1}$ (16). $\lambda = \pm i\Omega$ is an eigenvalue of infinitely multiple degeneracy. For $N_0 \neq 0$ there are two types of eigenvalues. The first type corresponds to plasma oscillations, and for $N_0 \longrightarrow 0$ λ is given by (16). The second type corresponds to internal plasma oscillations, and for $N_0 \longrightarrow 0$ $-\lambda^2$ tends toward the square of the plasma frequencies. The most interesting oscillations occur if

$$\left.\begin{aligned} \lambda^2 + \Omega^2 &= -\frac{\omega^2}{\beta^2}, \\ \alpha_{1,2} &= -\frac{\lambda}{V_0}(1 \mp \beta), \end{aligned}\right\} \qquad (17).$$

β tends to a constant value if $\omega \longrightarrow 0$. The existence of plasma boundaries does not alter the principal results obtained in hydrodynamic approxima-

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Electron oscillations...

tion for the instability of steady states in an unbounded plasma in the presence of an electron beam. The further results obtained here are in qualitative agreement with those obtained by Looney et al. A quantitative comparison is not possible since the electron density in the beam was much higher than in the plasma. Yu. L. Klimotovich is thanked for a discussion of several interesting problems. There are 3 figures and 4 references: 2 Soviet-bloc and 2 non-Soviet-bloc.

ASSOCIATION: Matematicheskiy institut im. V. A. Steklova Moskva
(Institute of Mathematics imeni V. A. Steklov, Moscow)

SUBMITTED: July 20, 1960

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IORDANSKIY, S.V.

Excitati n of magnetoacoustic waves in a conducting fluid.
Dokl. AN SSSR 146 no.3:557-560 S '62. (MIRA 15:10)

1. Matematicheskiy institut im. V.A.Steklova AN SSSR. Predstavleno akademikom L.I.Sedovym.
(Magnetohydrodynamics)

(4120) (2119) (5105)

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S/057/63/033/001/013 /017
B125/B186

AUTHOR: Iordanskiy, S. V.

TITLE: On the resonance excitation of waves in an infinitely conducting liquid

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 33, no. 1, 1963, 105 - 114

TEXT: The characteristic longitudinal waves close to resonance in an infinitely well conducting liquid are studied in magnetohydrodynamic approximation. This problem is closely analogous to that treated in gas dynamics (C. Bechow, Phys. Fluids, 1, no. 3, 205, 1958). H_x, H_y, H_z are the components of the magnetic field strength; v_x, v_y, v_z the components of the velocity vector; ρ the density of the liquid; $c^2 = (\partial p/\partial \rho)_s$ the square of the sonic velocity. The smallness of the external exciting field makes it possible to write $\vec{H} = \vec{H}_0 + \vec{h}$, $\rho = \rho_0 + \rho'$, with $|\vec{H}_0| \gg |\vec{h}|$, $\rho_0 \gg \rho'$, etc. The right-hand sides of the magnetohydrodynamic equations are considered after separation of the linear part of the perturbation. The solution of

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On the resonance excitation of waves ...

the separated linear equations consists of a slow and a fast acoustic wave with velocities

$$u_{1,2}=\frac{1}{2}\left\{\sqrt{c_0^2+\frac{H_0^2}{4\pi\rho_0}+\frac{H_{0x}c_0}{\sqrt{\pi\rho_0}}}\pm\sqrt{c_0^2+\frac{H_0^2}{4\pi\rho_0}-\frac{H_{0x}c_0}{\sqrt{\pi\rho_0}}}\right\} \quad (1.3)$$

and an Alfven wave with velocity $u_3 = H_{ox}/\sqrt{4\pi\rho_0}$. Each of these three waves is characterized by arbitrary functions $\Lambda_1^{\pm}$, $\Lambda_2^{\pm}$, $\Lambda_3^{\pm}$. The boundary conditions

$$\left.\begin{aligned}&\Lambda_i^+-\mu\Lambda_i^-=0\ (x=l);\ \Lambda_i^+-\mu\Lambda_i^-=\varepsilon\cos\omega t\ (x=0),\\&\sum_k(\alpha_{jk}\Lambda_k^+ + \beta_{jk}\Lambda_k^-)=0,\ (x=l,\ x=0,\ k\neq i,\ j\neq i);\end{aligned}\right\} \quad (1.4)$$

can cause a deviation of the spectrum from the integral multiple of any of the fundamental frequencies. Close to the resonance the next higher corrections need consideration, for which $|\Lambda_i|\gg\varepsilon$ and $|\Lambda_i|\gg|\Lambda_j|$, Λ_i and Λ_j being invariants. The perturbation traverses the distance 2l in the time τ, derived by

$$\tau=\int_{S_1}\frac{dx}{u_i+aL^++\beta L^-}-\int_{S_2}\frac{dx}{u_i+aL^-+\beta L^+}\approx$$

$$\approx\frac{2l_0}{u_i}+\frac{2\Delta l}{u_i}-\frac{a(1+\mu)l_0}{u_i^2}L^-(t)-\frac{\beta(1+\mu)}{u_i^2}\int_0^{l_0}L^-\left(t+\frac{2\pi x}{u_i l_0}\right)dx.$$

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